

## ABSTRACT

An optical fiber communication system according to the present invention has, for example, first and second phase conjugators. The first phase conjugator converts a signal beam from a first optical fiber into a first phase conjugate beam. The first phase conjugate beam is supplied to the second phase conjugator by a second optical fiber. The second phase conjugator converts the first phase conjugate beam into a second phase conjugate beam. The second phase conjugate beam is transmitted by a third optical fiber. The second optical fiber is composed of a first portion located between the first phase conjugator and a system midpoint and a second portion located between the system midpoint and the second phase conjugator. The total dispersion of the first optical fiber substantially coincides with the total dispersion of the first portion, and the total dispersion of the second portion substantially coincides with the total dispersion of the third optical fiber. By the construction, waveform distortion by chromatic dispersion or nonlinearity is compensated for.